

IIa. Intermittent or Campaign Measurement Activities (Listed according to Station Latitude)

Northern Hemisphere High-Latitude Stations (60°N - 90°N)

Eureka, Canada (80.05°N, 86.42°W)

FTIR	P. Woods, B. Bell, C. Paton-Walsh, and T. Gardiner (NPL) – Bruker 120M (0.004 cm ⁻¹ resolution) used for intercomparisons and campaigns. Measurements in Eureka were made in May 1999.
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Ny Ålesund, Spitsbergen (78.92°N, 11.93°E)

FTIR	P. Woods, B. Bell, C. Paton-Walsh, and T. Gardiner (NPL) – Bruker 120M (0.004 cm ⁻¹ resolution) used for intercomparisons and campaigns. Measurements in Ny Ålesund May to June 1995.
Lidar (Aerosol, Ozone, Temperature, and Water Vapor)	T. J. McGee (GSFC), L. Twigg (SSAI), and G. Sumnicht (SSAI) – The STROZ lidar retrieves ozone vertical profiles in the stratosphere from 10 to 50 km. Temperature to ~80 km and aerosols (at 355 nm) to 35 km also are measured. The instrument has also been modified to measure water vapor from near the ground to ~10 km. As a mobile intercomparator, it has participated in an ozone intercomparison in Ny Ålesund in September 1997 and January – February 1998.
Lidar (Aerosol)	O. Schrems and F. Immler (AWI) – Mobile Aerosol Raman Lidar (MARL), participated the NAOMI intercomparison in Ny Ålesund in January/February 1998.

Thule, Greenland (76.53°N, 68.74°W)

Microwave (ClO)	R. de Zafra (SUNY) – Two mm wave spectrometers (a rebuild of the original SUNY instrument and a new unit) have operated in a campaign mode since 1990. Measurements were conducted at Thule for the winters of 1992 and 1993. N ₂ O measurements are also available at Thule for the winter of 1992.
Microwave (Ozone)	R. de Zafra and G. Muscari (SUNY) – Conducted winter deployments at Thule in 2002 and 2003, measuring ozone (up to about 60 to 70 km) and CO. Each species was measured once daily for about five weeks, weather permitting. HNO ₃ and N ₂ O are available from the investigators for 2002.

Resolute, Canada (74.7°N, 95.0°W)

Sondes (Aerosol)	D. Tarasick (EC) and J. Rosen (U. Wyoming) – Backscatter measurements of aerosol profiles available for October 1991.
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Esrangle, Sweden (67.9°N, 21.1°E)

FTIR	G. C. Toon (JPL) – Operation of a home-built interferometer (JPL MkIV with 0.006 cm ⁻¹ resolution). Archived database exists from SOLVE/THESEO campaign (winter 1999/2000) and from January to April 2003. Balloon-borne data for this instrument also exist for mid- and high-latitudes.
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Sodankylä, Finland (67.37°N, 26.65°E)

Lidar (Aerosol, Ozone, Temperature, and Water Vapor)	T. J. McGee (GSFC), L. Twigg (SSAI), and G. Sumnicht (SSAI) – The STROZ lidar retrieves ozone vertical profiles in the stratosphere from 10 to 50 km. Temperature to ~80 km and aerosols (at 355 nm) to 35 km also are measured. The instrument has also been modified to measure water vapor from near the ground to ~10 km. As a mobile intercomparator, it has participated in an ozone intercomparison at Sodankylä during March – April 1996 and in February 2007.
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Søndre Strømfjord, Greenland (66.99°N, 50.95°W)

FTIR	J. Hannigan, M. Coffey, and W. Mankin (NCAR) – Campaign data have been archived for the period October 1994 to March 1995.
Sondes (Aerosol)	J. Rosen (U. Wyoming) and N. Larsen (DMI) – Backscatter measurements of aerosol profiles available for January 1995 and January 1996.

Salekhard, Russia (66.5°N, 66.7°E)

Sondes (Aerosol)	J. Rosen (U. Wyoming) and V. Yushkov (CAO) – Backscatter measurements of aerosol profiles available for March 1999 and January 2000.
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Fairbanks, AK, USA (64.82°N, 147.87°W)

FTIR	G. Toon (JPL) – Operation of a home-built interferometer (JPL MkIV with 0.006 cm ⁻¹ resolution). Ground-based and balloon data obtained during the POLARIS campaign (summer 1997).
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Arkhangel'sk, Russia (64.6°N, 40.5°E)

Sondes (Aerosol)	J. Rosen (U. Wyoming) and V. Khattatov (CAO) – Backscatter measurements of aerosol profiles available for November – December 1993.
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Harestua, Norway (60.2°, 10.8°E)

FTIR	P. Woods, B. Bell, C. Paton-Walsh, and T. Gardiner (NPL) – Bruker 120M (0.004 cm ⁻¹ resolution) used for intercomparisons and campaigns. Measurements in Harestua were made from September – October 1994.
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Lerwick, UK (60.1°N, 1.1°E)

UV/Vis. Spectrometer	G. Vaughan (U. Manchester) – SAOZ system operated during EASOE campaign (November 1991 – April 1992. See entry in Section Ia under Aberystwyth, UK for further details.
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Northern Hemisphere Midlatitude Stations (30°N - 60°N)

Aberdeen, UK (57.15°N, 2.15°W)

FTIR	P. Woods, B. Bell, C. Paton-Walsh, and T. Gardiner (NPL) – Bruker 120M (0.004 cm ⁻¹ resolution) used for intercomparisons and campaigns. Measurements in Aberdeen were made during SESAME I for January to May 1994 and SESAME II for November 1994 to April 1995.
UV/Vis. Spectrometer	G. Vaughan (U. Manchester) – SAOZ system operated during the SESAME I campaign (February - April 1994). See entry in Section Ia under Aberystwyth, UK for further details.

Prestwick, Scotland (55.50°N, 4.61°W)

Lidar (Aerosol)	O. Schrems and F. Immler (AWI) – Mobile Aerosol Raman Lidar (MARL), participated; campaign data were obtained at Prestwick from September to October 2000.
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Lindenberg, Germany (52.52°N, 9.57°E)

Lidar (Aerosol)	O. Schrems and F. Immler (AWI) – Mobile Aerosol Raman Lidar (MARL), participated; campaign data were obtained at the Meteorological Observatory in Lindenberg, Germany from April to October 2003.
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Hohenpeissenberg, Germany (47.80°N, 11.02°E)

Lidar (Aerosol, Ozone, Temperature, and Water Vapor)	T. J. McGee (GSFC), L. Twigg (SSAI), and G. Sumnicht (SSAI) – The STROZ lidar retrieves ozone vertical profiles in the stratosphere from 10 to 50 km. Temperature to ~80 km and aerosols (at 355 nm) to 35 km also are measured. The instrument has also been modified to measure water vapor from near the ground to ~10 km. As a mobile intercomparator, it has participated in an ozone and temperature intercomparisons at Hohenpeissenberg in October 2005.
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Jungfrauoch, Switzerland (46.55°N, 7.98°E)

FTIR	P. Woods, B. Bell, C. Paton-Walsh, and T. Gardiner (NPL) – Bruker 120M (0.004 cm ⁻¹ resolution) used for intercomparisons and campaigns. Measurements in Jungfrauoch were made in October 2002.
	M. Carleer (U. Brussels) and M. De Mazière (IASB-BIRA) – Bruker 120M: side-by-side intercomparison campaign (May 1998) and differential measurements Grindelwald (1070 m asl) – Jungfrauoch (3580 m asl) (June 1998).

Observatoire Haute Provence, France (43.94°N, 5.71°E)

Lidar (Aerosol, Ozone, Temperature, and Water Vapor)	T. J. McGee (GSFC), L. Twigg (SSAI), and G. Sumnicht (SSAI) – The STROZ lidar retrieves ozone vertical profiles in the stratosphere from 10 to 50 km. Temperature to ~80 km and aerosols (at 355 nm) to 35 km also are measured. The instrument has also been modified to measure water vapor from near the ground to ~10 km. As a mobile intercomparator, it has participated in ozone intercomparisons at OHP for July – August 1992 and for June – July 1997.
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Greenbelt, MD, USA (38.9°N, 76.7°W)

Lidar (Aerosol, Temperature, and Water Vapor)	T. J. McGee (GSFC), G. Sumnicht (SSAI), and L. Twigg (SSAI) – The Aerosol and Temperature Lidar (AT Lidar) has been rebuilt, and now includes water vapor to >10 km, temperature in the troposphere using rotational Raman backscatter, stratospheric temperature up to ~80 km, and aerosol parameters using elastic and Raman backscatter up to ~35 km. When not participating in campaigns, the instrument conducts measurements at the NASA Goddard Space Flight Center in Greenbelt, MD.
Lidar (Aerosol, Ozone, Temperature, and Water Vapor)	T. J. McGee (GSFC), L. Twigg (SSAI), and G. Sumnicht (SSAI) – The STROZ lidar retrieves ozone vertical profiles in the stratosphere from 10 to 50 km. Temperature to ~80 km and aerosols (at 355 nm) to 35 km also are measured. The instrument has also been modified to measure water vapor from near the ground to ~10 km. When not participating in campaigns, the instrument conducts measurements at the NASA Goddard Space Flight Center in Greenbelt, MD.

Mt. Barcroft, CA, USA (37.58°N, 118.24°W)

FTIR	G. C. Toon (JPL) – Intermittent operation of a home-built interferometer (JPL MkIV with 0.006 cm ⁻¹ resolution) from August 1994 to July 2002. This instrument was also launched on a balloon periodically between October 1998 and July 1999. A database from JPL (Pasadena, CA; 34.20°N, 118.17°W) also exists dating back to 1988.
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Table Mountain, CA, USA (34.4°N, 117.7°W)

FTIR	P. Woods, B. Bell, C. Paton-Walsh, and T. Gardiner (NPL) – Bruker 120M (0.004 cm ⁻¹ resolution) used for intercomparisons and campaigns. Measurements at the Table Mountain Facility were made in October 1996.
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FTIR	G. C. Toon (JPL) – Intermittent operation of a home-built interferometer (JPL MkIV with 0.006 cm ⁻¹ resolution) from January to August 1998.
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Lidar (Aerosol)	O. Schrems and F. Immler (AWI) – Mobile Aerosol Raman Lidar (MARL), participated; campaign data were obtained during the STRAIT intercomparison campaign at TMF in February/March 1997.
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Lidar (Aerosol, Ozone, Temperature, and Water Vapor)	T. J. McGee (GSFC), L. Twigg (SSAI), and G. Sumnicht (SSAI) – The STROZ lidar retrieves ozone vertical profiles in the stratosphere from 10 to 50 km. Temperature to ~80 km and aerosols (at 355 nm) to 35 km also are measured. The instrument has also been modified to measure water vapor from near the ground to ~10 km. As a mobile intercomparator, it has participated in ozone intercomparisons at the Table Mountain Facility February/March 1992, February/March 1997, June 2004, June 2005, and October 2009 (MOHAVE).
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Lidar (Aerosol, Temperature, and Water Vapor)	T. J. McGee (GSFC), G. Sumnicht (SSAI), and L. Twigg (SSAI) – The Aerosol and Temperature Lidar (AT Lidar) has been rebuilt, and now includes water vapor to >10 km, temperature in the troposphere using rotational Raman backscatter, stratospheric temperature up to ~80 km, and aerosol parameters using elastic and Raman backscatter up to ~35 km. It has participated in ozone intercomparisons at the Table Mountain Facility in June 2005, October 2007, and October 2009 (MOHAVE).
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Northern Hemisphere Subtropical and Tropical Stations (0°N - 30°N)

Izaña (Tenerife), Spain (28.30°N, 16.48°W)

Spectral UV	G. Seckmeyer (U. Hannover) - Intercomparison campaign data for July 2005.
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Mauna Loa, Hawaii (19.54°N, 155.58°W)

Lidar (Aerosol, Ozone, Temperature, and Water Vapor)	T. J. McGee (GSFC), L. Twigg (SSAI), and G. Sumnicht (SSAI) – The STROZ lidar retrieves ozone vertical profiles in the stratosphere from 10 to 50 km. Temperature to ~80 km and aerosols (at 355 nm) to 35 km also are measured. The instrument has also been modified to measure water vapor from near the ground to ~10 km. As a mobile intercomparator, it has participated in ozone and temperature intercomparisons at Mauna Loa from June 1995 – February 1996 and August 2002.
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Paramaribo, Surinam (5.75°N, 55.2°W)

FTIR	O. Schrems (AWI) and J. Notholt (U. Bremen) – Bruker 120M (0.004 cm ⁻¹ resolution). Participated in the STAR campaign in Paramaribo in November 2004. Measurements continue during the dry season each year since 2004.
Lidar (Aerosol)	O. Schrems and F. Immler (AWI) – Mobile Aerosol Raman Lidar, participated in the STAR campaign at Paramaribo in November 2004. Measurements continue during the dry season each year since 2004.

Southern Hemisphere Subtropical and Tropical Stations (0°N - 30°S)

No intermittent or campaign measurement activities.

Southern Hemisphere Midlatitude Stations (30°S - 60°S)

Lauder, New Zealand (45.04°S, 169.68°E)

FTIR	P. Woods, B. Bell, C. Paton-Walsh, and T. Gardiner (NPL) – Bruker 120M (0.004 cm ⁻¹ resolution) used for intercomparisons and campaigns. Measurements at Lauder were made in February 1997.
Lidar (Aerosol, Ozone, Temperature, and Water Vapor)	T. J. McGee (GSFC), L. Twigg (SSAI), and G. Sumnicht (SSAI) – The STROZ lidar retrieves ozone vertical profiles in the stratosphere from 10 to 50 km. Temperature to ~80 km and aerosols (at 355 nm) to 35 km also are measured. The instrument has also been modified to measure water vapor from near the ground to ~10 km. As a mobile intercomparator, it has participated in ozone intercomparisons at Lauder October – December 1992, March – October 1994, April 1995, September – December 2001, and April 2002.

Punta Arenas, Chile(53.17°S, 70.93°W)

Lidar (Aerosol)	O. Schrems and F. Immler (AWI) – Mobile Aerosol Raman Lidar (MARL), participated in the INCA campaign in Punta Arenas in March/April 2000.
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Southern Hemisphere High-Latitude Stations (60°S - 90°S)

McMurdo Station, Antarctica (77.85°S, 166.63°E)

- Microwave (CLO) R. de Zafra (SUNY) – Deployments of a mm wave spectrometer for the austral springs of 1992 to 1995. N₂O measurements are also available at McMurdo for the austral spring of 1994.
- R. de Zafra (SUNY) – Measurements (using the SIS receiver/spectrometer) were made during the austral springs of 1997 and 1998 for an intercomparison with the Millitech instrument at Scott Base (see entries in Sections Ia and Ib).

South Pole Station, Antarctica (90.00°S)

- Microwave (Ozone) R. de Zafra (SUNY) – Two mm wave spectrometers (a rebuild of the original SUNY instrument and a new unit) have operated in a campaign mode since 1990. Deployments at South Pole Station were for 11-month periods in 1993 and 1995. Also has retrieved N₂O, and HNO₃.

Ship-Based Measurements

- FTIR O. Schrems (AWI) and J. Notholt (U. Bremen) – Bruker 120M (0.004 cm⁻¹ resolution), deployed 1992 to 1995 at Ny Ålesund (78.92°N, 11.93°E) and now utilized as a mobile instrument. Operated as part of the ALBATROSS ship-based expedition from 70°N to 40°S during October and November 1996. Participated in additional ship-based expeditions in 1999/2000 (from 80°N to 70°S), in June 2000, January/February 2003, October/November 2003, and October/November 2005.
- Lidar (Aerosol) O. Schrems and F. Immler (AWI) – Mobile Aerosol Raman Lidar (MARL), participated in the ALBATROSS ship-based campaign from 70°N to 40°S during October and November 1996; the LIMPIDO ship-based campaign from 53°S to 53°N in May/June 2000; and another ship-based campaign from 53°N to 33°S in October to November 2003, and October to November 2005.